HR-1001 Low Power RF Module
User Manual

ORIENTAL HUARAY GROUP LIMITED

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Before using HR-1001 Module, please carefully read the user manual, any question in technical, you can contact us: telephone: 86 755 81782516 Cell: 86 15813856667

一、HR-1001 Main Application Range:

HR-1001 low power transceiver data module is used at wireless transceiver data in short-ranges, with the small size, weight and power consumption and good stability and reliability. Narrowband low power UHF wireless data transmitters and receivers with channel spaces as low as 25 KHz:

* Water、Electricity、Gas Meter AMR Automatic Meter Reading
* Wireless alarm and security systems
* Home automation

* Low power telemetry
* Wireless conference voting system;
* Sports training & competition;
* Wireless dishes ordering;
* Wireless POS, PDA wireless smart terminal;
* Electronic bus station and intelligent traffic;
* RF transmitter Wireless electronic display screen and queuing machine;
* Wireless telemetry Charging for parking, parking lot;
* Wireless modem Automobile inspection and four-wheel orientation;
* Wireless sensor Industrial wireless remote control and air conditioning remote controller;
* Observation and predication of oil well and hydrological information;
* Point to multi-point wireless network, wireless on-the-spot bus and automatic data collection system;

二、HR-1001 Features:

1. Low power transmission

The transmission power is 10mW (10dB), Receiving sensitivity: 10dbm

2. Low power consumption

Receiving current<11mA，transmission current<45mA，sleeping current (the user should asked for it before order) <3uA.

3. ISM frequency band, not requiring on application of frequency point

Carrier frequency: 433MHz, also capable of 868/915/2400/5600MHz.

4. Interface

HR-1001 supply UART, TTL, RS232, RS485, user can choose any one of them before shipped.

5. High anti-jamming and low BER (Bit error Rate)

Based on the FSK modulation mode, it adopts the efficient communication protocol. The actual bit error rate of 10-5 ~ 10-6 can be achieved when channel bit error rate is 10-2.

6. Long transmission distance

Within the range of visibility, when the antenna height is greater than 1m, the reliable transmission distance is（BER=10-3/1200bps）>300m， (BER=10-3/9600bps) >200m

7. Transparent data transmission

Transparent data interface is offered, which can be fit for nonstandard user protocol. Any false data generated in the air can be filtrated automatically (What has been received is exactly what has been transmitted). Receiving and dispatching switching time<10ms.

8. Multi-channels and Multi-speeds

The HR-1001 module provides 8 channels to meet many kinds of communication combination mode of the users. The HR-1001 module can provide many kinds of correspondence baudrate such as 1200bps, 2400bps, 4800bps, 9600bps, 19200bps and so on.

The wireless transmission speed and the connection baudrate are proportional, to satisfies the customer equipment of different baudrate.

9. High speed wireless communication and Large data buffer

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When the RF baudrate is bigger than the COM baudrate , may transmit infinitely data continuously, and when the RF baudrate is samaller than or was equal to the COM baudrate ,may transmit 255 bytes data.

10. Intelligent data control and the user doesn't need to prepare excessive programs

Even for semi duplex communication, the user doesn't need to prepare excessive programs, only receiving/transmitting the data from the interface. HR-1001 will automatically complete the other operations, such as transmission/receiving conversion in the air, control, etc.

11. High reliability, small and light

Single chip radio-frequency integrated circuit and single chip MCU are used for lessened peripheral circuits, high reliability, and low failure rate.

12. Watchdog monitor

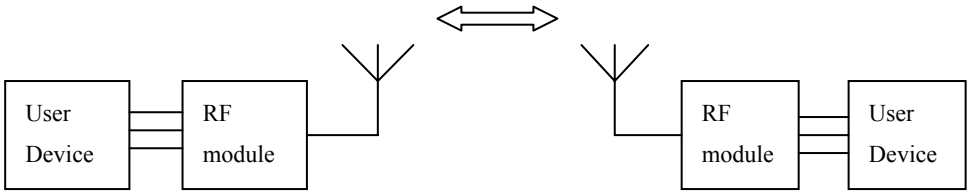
Watchdog monitors the inner function, so it can change the traditional product structure and improve the product reliability.

13. Matched antenna

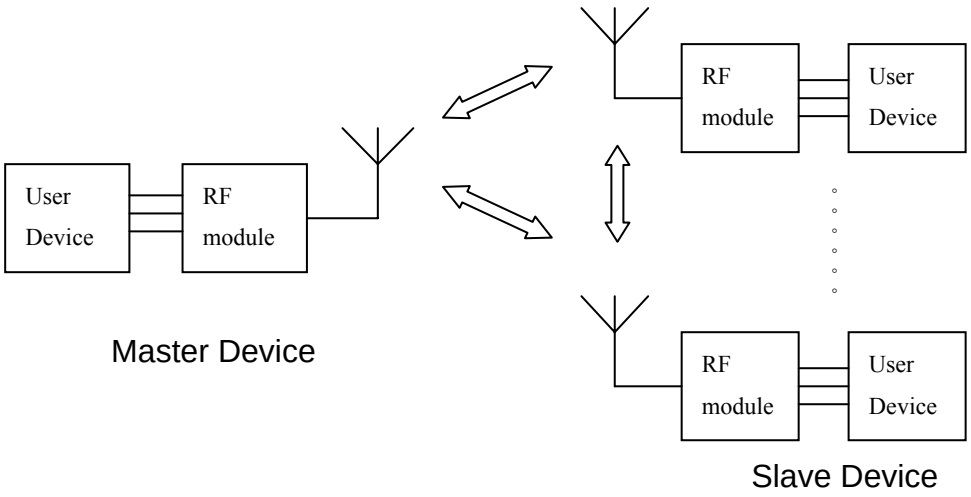
There are many antenna configuration, according to the user's site supporting different antennas, to achieve the best results

三、Application:

1 、Point to point communication



2 、Point to multi-point communication



3 、Multi-point to multi-point communication

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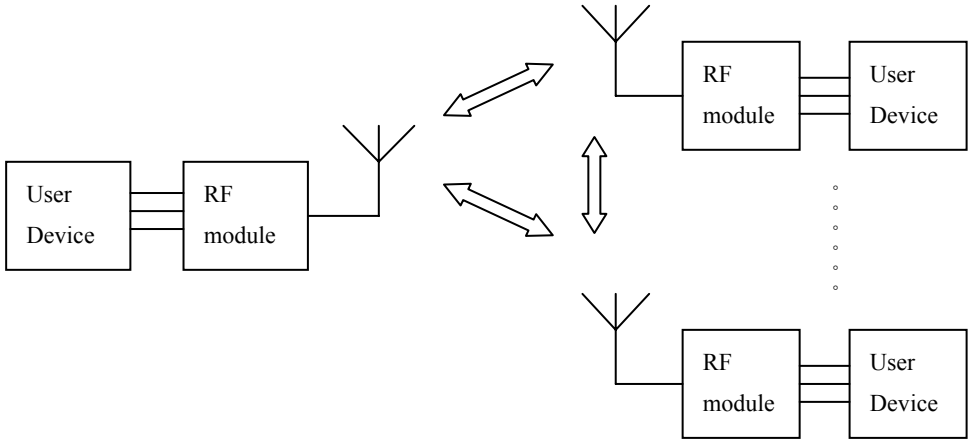
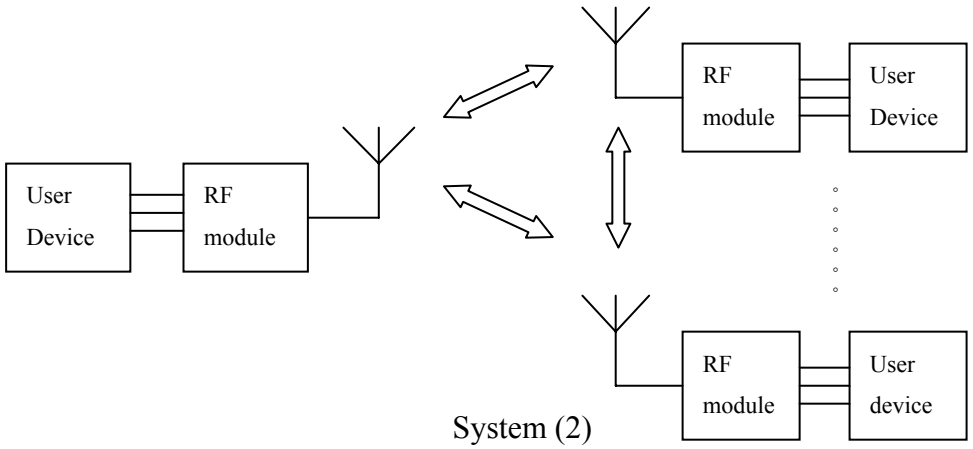


System (1)



System (2)

四、Orde message:

1、Type: HR-1001

2、Optional antenna Spillikin, short ebb SMA antenna, 7P cable

For example: you decide to order HR-1001 module, including spillikin SMA antenna, 7P cable.

3、Note: if the user don`t need antenna pedestal, we can directly weld antenna prolonged cable. User can also order special needs.

五、 HR-1001 Application Method

HR-1001 module supply RS232, RS485 and TTL(UART) interface which can connect computer, RS485 device, CPU or UART device, HR-1001 module application is as follow:

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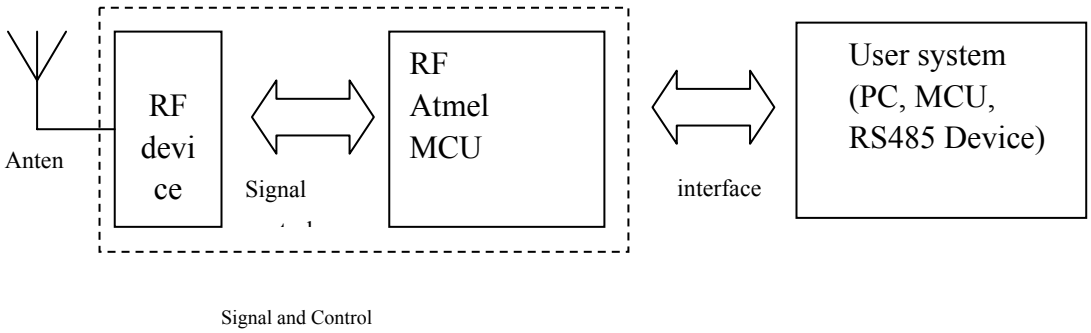

HR-1001 module application schematic diagram

1. Power

HR-1001 with +3.6~5.0V direct current， we can also set the power to 3V by customer needs.HR-1001 can share power with other equipment, but you will have to choose power of good ripples coefficient, user can also adopt 7805 or other Voltage Regulator to supply power if have good chance

Transmitting current ≤45mA,receiving current ≤11mA， sleeping current ≤3uA。

2. HR-1001 interface definition

HR-1001 supply one9-pin connector, an antenna connector, a jumpers (J1), a group speed repair short circuit bonding pad (J2,J3,J4,J5), the definition is as follows.

Table 1：interface Port

Pin No	HR-1001	Description	Level	Connected to Terminal	Memo
1	GND	Ground of power supply	GND	Ground of power supply	
2	VCC	PowerDC	＋3.6～5.0V		direct current supply input
3	RXD/TTL	Serial data receiving end	TTL	TXD	Com1 Receiving end
4	TXD/TTL	Serial data transmitting end	TTL	RXD	Com1 Transmitting end
5	SGND	Ground of signal	GND	Simulated signal	Can be connected to power
6	A(TX)	RS-485的A RS-232的TX	RS232/RS485	A(RX)	Com2 transmitting end/RS485-A
7	B(RX)	RS-485的B RS-232的RX	RS232/RS485	B(TX)	Com2 receiving end/RS485-B
8	SLEEP	Sleeping control （input）	TTL	Sleeping signal	Low level efficiency，time≥15ms
9	RESET	Reset control （input）	TTL	Reset signal	Low level efficiency，time≥1ms

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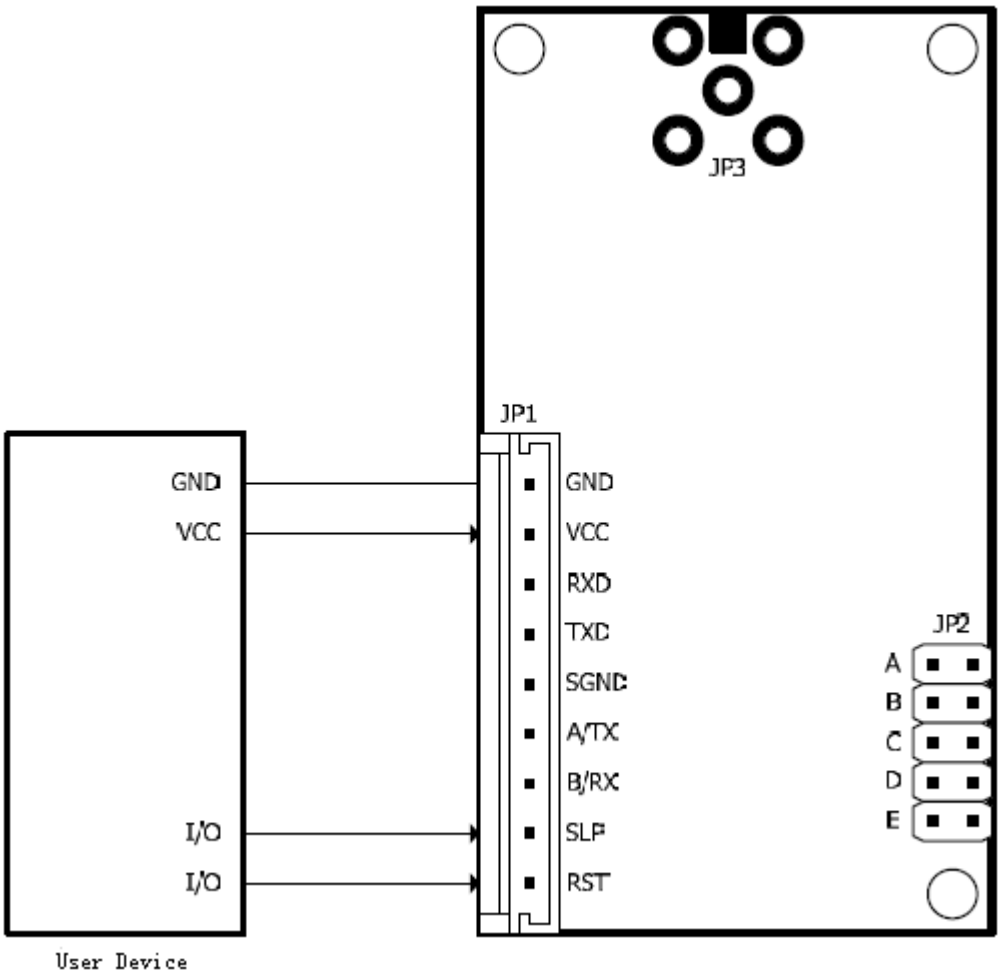
3. The picture of HR-1001 connecting device as follow：

HR-1001 can connect user CPU, also connect CPU system sharing DC3.6~5V, connecting SLP, RST to control sleep and reset, do not need to connect other Pin port which do not need.



HR-1001 can connect user TTL, RS232 or RS485 system device, also use the same DC3.6~5V as user system, not connecting SLP, RST。

Note: User do not need to connect the Pins which are not be used，in case interference.

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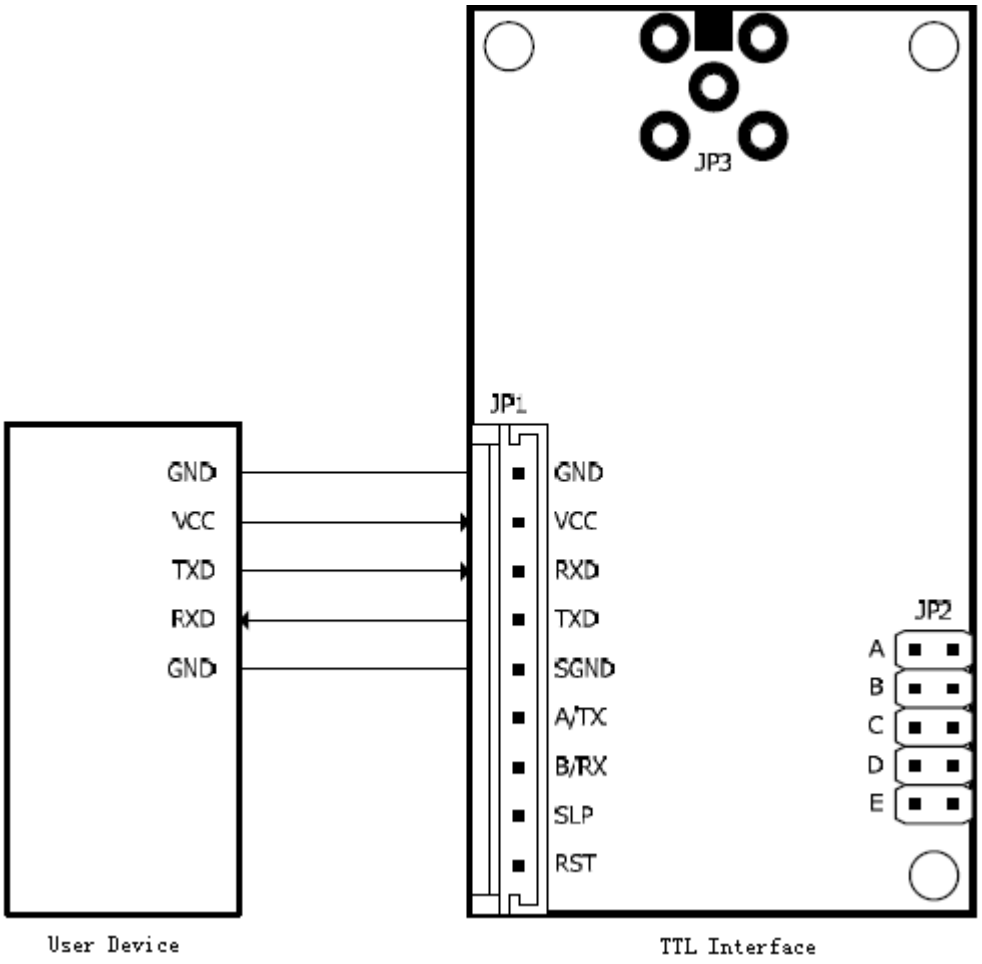

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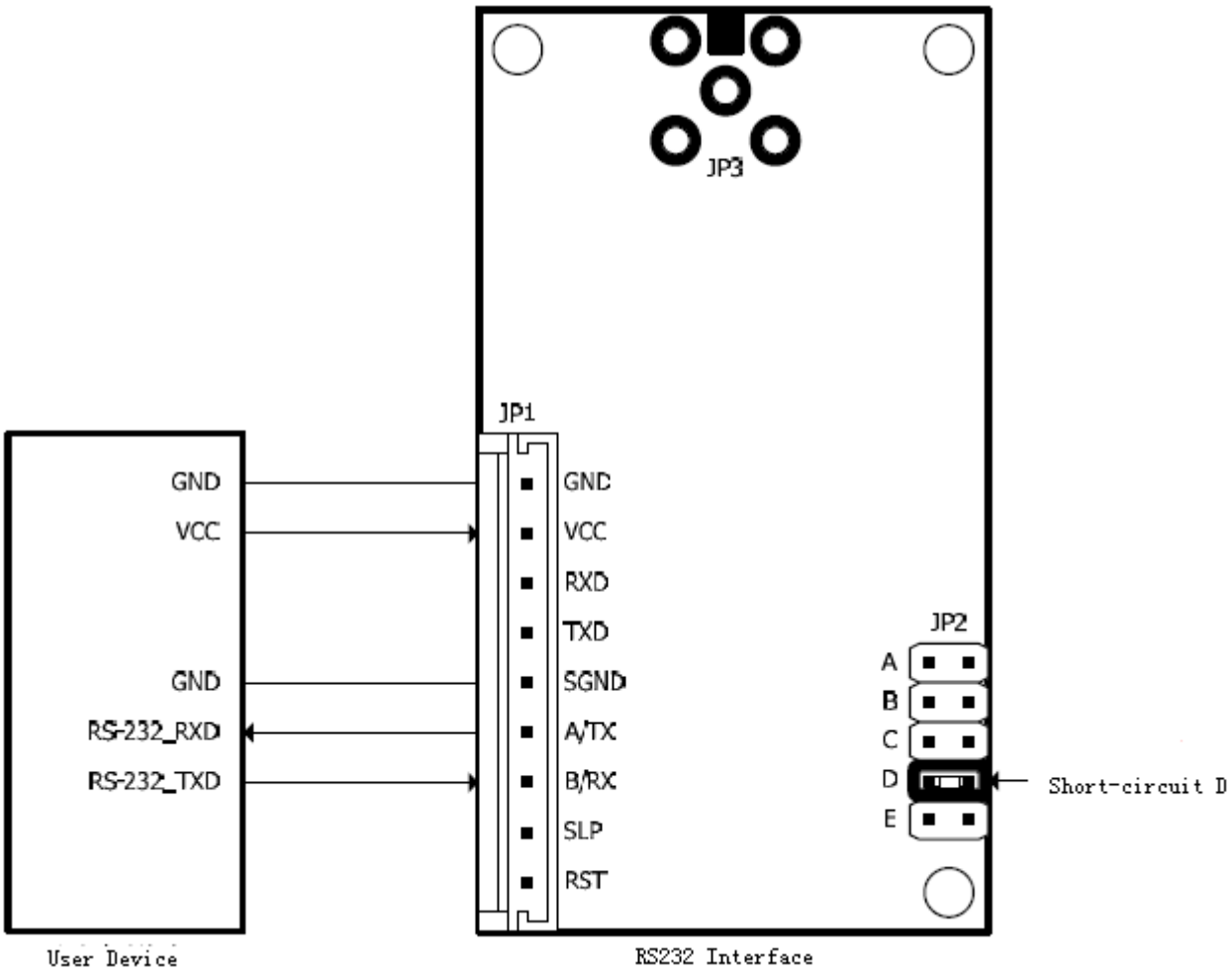

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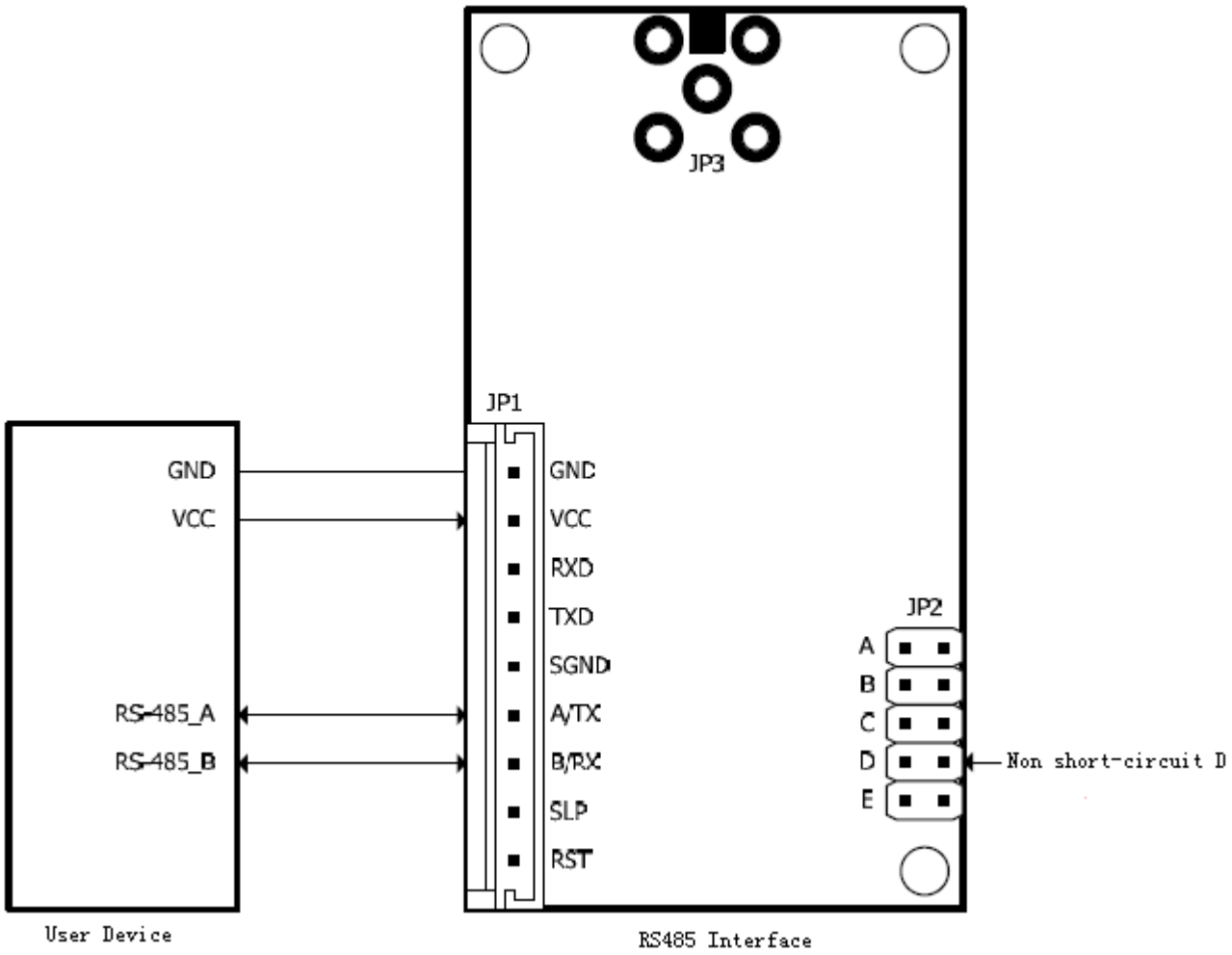

Connecting user computer port

4. Channel、Interface、Baud rate、parameter setting：

Before using HR-1001, user have to make simple configuration by needs，such as channel、interface and baud rate.

There is one group of 5-bit short-circuiter wire（J1）on the bottom right comer of HR-1001, defined as A、B、C、D、E respectively. Assuming the open circuit of jumper wire(without short circuiter) is mode 1 and short-circuiter of jumper wire(with short circuiter) is mode 0：

a. Channel configuration

ABC jumper wires of J1 provide 8 options and you can choose to use 0～7 channels，if the work wireless module is work at the same channel(ABC jumper wire mode is same), you can transmit data between each module but keep in mind, at the same time only one module is in TX mode, more detail is table2:

Table2：0—7 channel to frequency point and jumper：

Jumper CBA	Channel	Frequency	Jumper CBA	Channel	Frequency

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000	0(ABC not short)	433.30MHz	100	4	430.84MHz
001	1	432.68MHz	101	5	430.22MHz
010	2	432.07MHz	110	6	429.61MHz
011	3	431.45MHz	111	7(ABC short)	429.00MHz

Note：1、1 mean short，0 mean not short。

2、User can set the different frequency point by needs.

a. Interface choice：

HR-1001 supply two COM，COM1（CON1 Pin3、Pin4）which is TLL, UART；COM2(CON1 的Pin6,Pin7) via J1 D to choose interface：

D=0(not short)　　COM2=RS-485，RS-485的A/B口

D=1(short)　　COM2=RS-232，RS-232的TXD/RXD

b. J1 E is used to choose parity bits：8E1, 8O1 or 8N1

E=0(not short) 8E1/8O1　8 bit data，1 parity bit，or 8 bit data，1 bit mark

E=1(short)　8N1　　8 bit data，without parity bit

c.COM1/2 baud rate setting

HR-1001 supply 1200/2400/4800/9600bps，user can change the baud rate through reverse welded jumper（J2-J4）。Welded jumper disconnecting is 0，short circuiter is 1，welded jumper J4-J3 and baud rate is as follow:

Table3：Welded jumper J4-J2 to baud rate

No	J4、J3、J2	Baud rate(bps)
1	0　0　0	1200
2	0　1　0	2400
3	0　0　1	4800
4	0　1　1	9600

5.Sleeping and reset。

When the system is resting, user can control module to sleep to save power, control SLP(CON1 Pin8) keeping 15ms low level。When user need to reset module only to supply RST (connector CON1 Pin9) breadth > 1ms minus pulse。

Note：Sleepy module only via resetting to awake。

6.Outer dimension （Unit：MM）：

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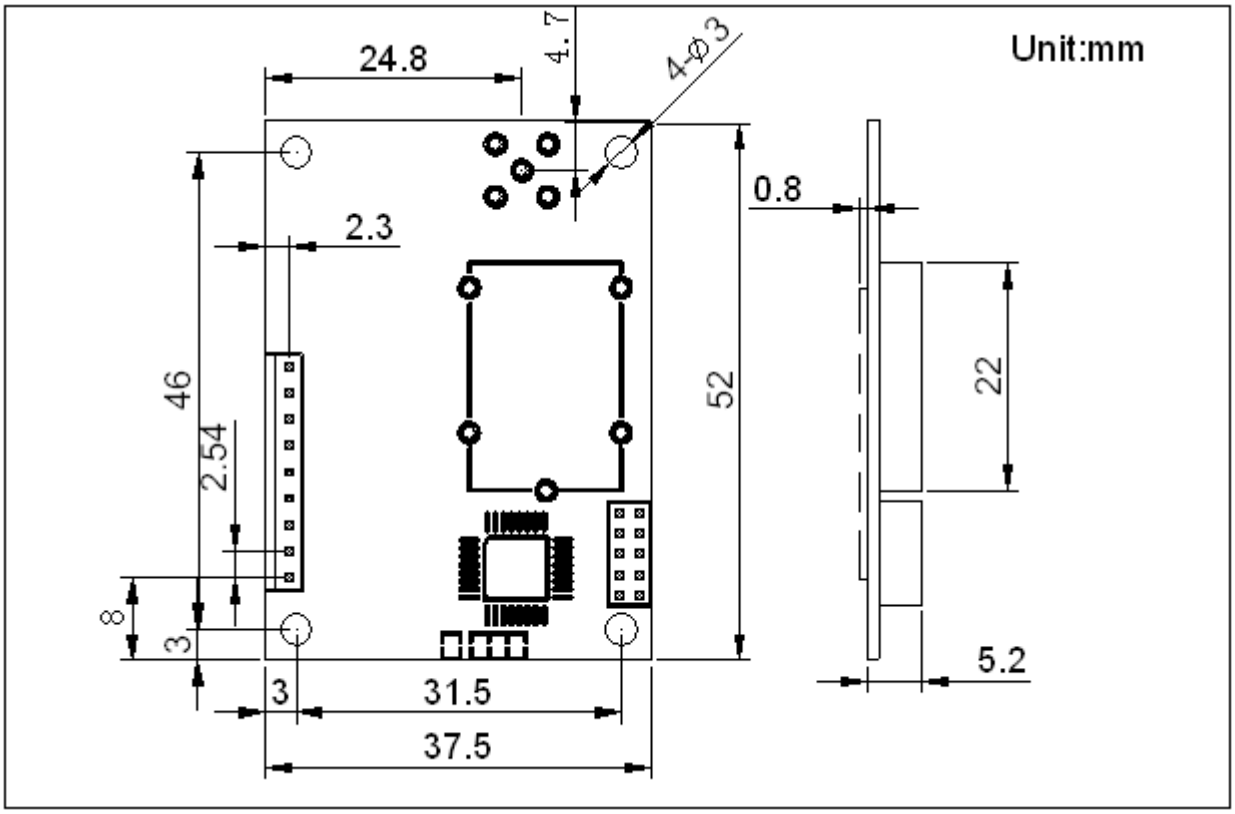
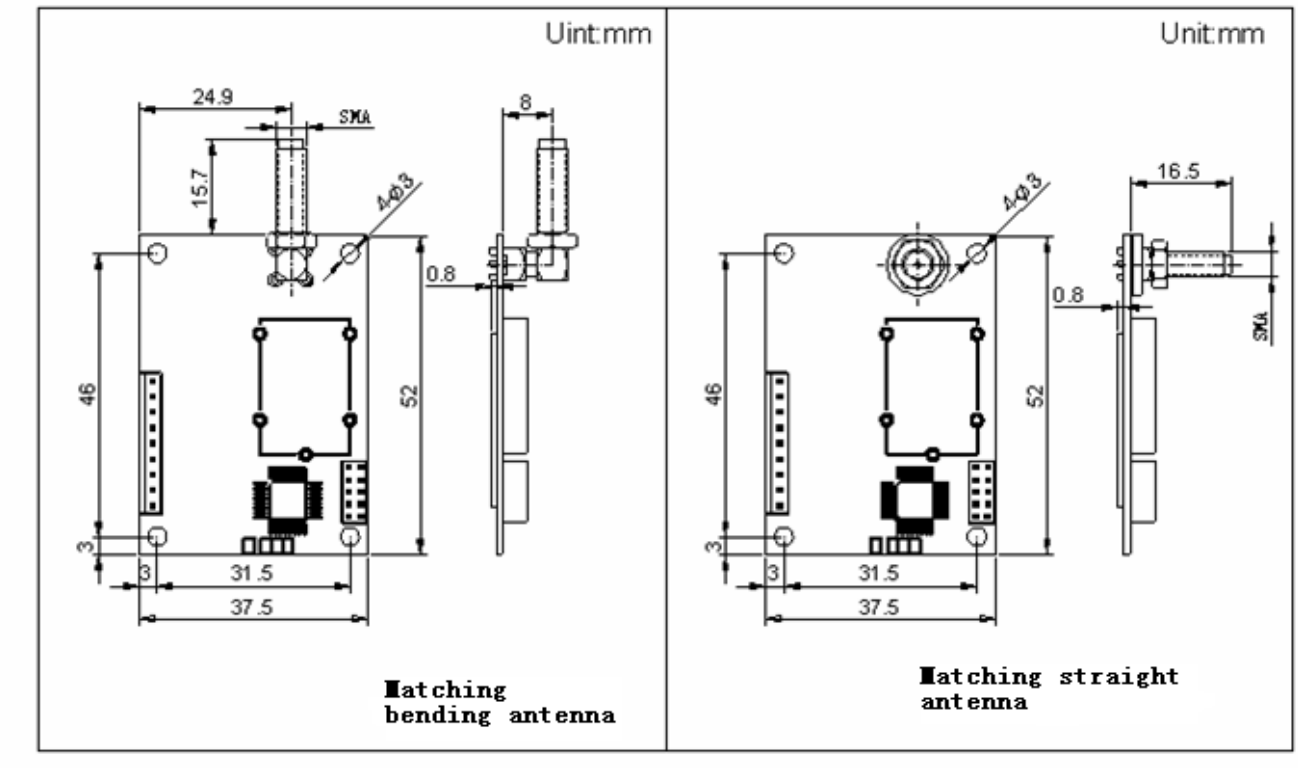


Matching bending or straight SMA Antenna：



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六、HR-1001 technical instruction

No	Technical instruction	Parameter	Memo
1	Modulation	GFSK/FSK	
2	Working frequency	429.00～433.30MHz	
3	Transmitting Power	10mW (10dBm)	
4	Receiving sensitivity	-105dBm	
5	Channel	8/16/32	User set
6	Transmitting current	≤45mA	
7	Receiving current	≤11mA	
8	Sleeping current	≤3uA	
9	Baud rate	1200/2400/4800/9600/19200bps	User set
10	Interface	UART/RS-232/RS-485	User set
11	Working voltage	+3.6～5.5VDC	
12	Working temperature	-40℃~85℃	
13	Store temperature	-65℃~150℃	
14	Working humidity	10%~90% relative humidity，without condensation	
15	Dimension	46mm×27mm×10mm(exclude antenna)	
16	Reliable transmit distance	400m	

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